CHAPTER 17
Medical Asepsis and Infection Control

Learning Outcomes

Cognitive Domain
1. Spell and define key terms
2. Describe the infection cycle, including the infectious agent, reservoir, susceptible host, means of transmission, portals of entry, and portals of exit
3. List major types of infectious agents
4. Compare different methods of controlling the growth of microorganisms
5. Discuss infection control procedures
6. List the various ways microbes are transmitted
7. Differentiate between medical and surgical asepsis used in ambulatory care settings, identifying when each is appropriate
8. Compare the effectiveness in reducing or destroying microorganisms using the various levels of infection control
9. Identify personal safety precautions as established by the Occupational Safety and Health Administration (OSHA)
10. Match types and uses of personal protective equipment (PPE)
11. Describe standard precautions, including transmission-based precautions, purpose, and activities regulated
12. Discuss the application of standard precautions with regard to all body fluids, secretions, and excretions; blood; nonintact skin; and mucous membranes
13. List the required components of an exposure control plan
14. Explain the facts pertaining to the transmission and prevention of the hepatitis B virus and the human immunodeficiency virus in the medical office
15. Identify the role of the Centers for Disease Control (CDC) regulations in health care settings

Psychomotor Domain
1. Participate in training on standard precautions
2. Perform a medical aseptic handwashing procedure (Procedure 17-1)
3. Remove contaminated gloves (Procedure 17-2)
4. Clean and decontaminate biohazardous spills (Procedure 17-3)
5. Apply local, state, and federal health care legislation and regulation appropriate to the medical assisting practice setting
6. Select appropriate barrier/PPE for potentially infectious situations

Affective Domain
1. Explain the rationale for performance of a procedure to the patient
2. Apply critical thinking skills in performing patient assessment and care

ABHES Competencies
1. Apply principles of aseptic techniques and infection control
2. Use standard precautions
3. Dispose of biohazardous materials
MULTIPLE CHOICE

Circle the letter preceding the correct answer.

Scenario for Questions 1 through 3: Susan enters the examination room, where a patient is being seen for flu-like symptoms. While Susan takes the patient’s blood pressure, the patient suddenly coughs near her face. Three days later Susan has the same signs and symptoms as the patient.

1. Which of the following terms best describes the patient in the infection cycle?
   a. Reservoir host
   b. Disease portal
   c. Pathogen portal
   d. Susceptible host
   e. Disease transmitter

2. Which of the following procedures could Susan have performed that might have helped to minimize contracting the patient’s disease?
   a. Ask the patient to look the other way while coughing.
   b. Put on a facemask before entering the exam room.
   c. Run out of the room right after the patient coughed.
   d. Wash her face right after the coughing episode.
   e. Sterilize the examination room.

3. What type of transmission process occurred during Susan’s contact with the patient?
   a. Direct
   b. Vector
   c. Viable
   d. Manual
   e. Indirect

4. *Clostridium tetani* causes tetanus. Because it does not require oxygen to survive, this microbe is an example of an:
   a. anoxic bacteria.
   b. aerobic bacteria.
   c. anaerobic bacteria.

5. Which of the following groups of conditions best favors microbial growth?
   a. Cold, light, and dry
   b. Dry, dark, and warm
   c. Dark, moist, and cool
   d. Warm, moist, and light
   e. Moist, warm, and dark

6. *Escherichia coli* is normally found in the intestinal tract. *E. coli* can be transmitted to the urinary tract, causing an infection. When in the urinary tract, *E. coli* is an example of:
   a. viral flora.
   b. normal flora.
   c. resident flora.
   d. resistant flora.
   e. transient flora.

7. Which of the following practices is most important for maintaining medical asepsis?
   a. Airing out examination rooms after each patient
   b. Receiving all available vaccinations on an annual basis
   c. Wearing gloves before and after handling medical tools
   d. Wearing a gown if you are concerned about bodily fluids
   e. Washing your hands before and after each patient contact

8. To minimize infection, an endoscope should be:
   a. rinsed.
   b. sanitized.
   c. sterilized.
   d. disinfected.
   e. germicided.
9. At which temperature do most pathogenic microorganisms thrive?
   a. Below 32°F
   b. Above 212°F
   c. Around body temperature
   d. Around room temperature
   e. At any temperature

10. What level of disinfection would be appropriate to use when cleaning a speculum?
   a. None
   b. Low
   c. Intermediate
   d. High
   e. Sterilization

11. Which of the following job responsibilities has the highest risk exposure in the group?
   a. Measuring a patient’s body temperature
   b. Covering a urine-filled specimen jar
   c. Drawing blood for lab analysis
   d. Auscultating a blood pressure
   e. Irrigating a patient’s ear for excess earwax.

12. OSHA is responsible for:
   a. certifying all medical doctors.
   b. vaccinating school-age children.
   c. ensuring the safety of all workers.
   d. analyzing medical laboratory samples.
   e. caring for people with contagious diseases.

13. Jeremy approaches you and says that he just accidentally stuck himself with a needle while drawing a blood sample from a patient. He points to his thumb, where you can see a puncture. There is no bleeding. Which of the following actions should you take first?
   a. Direct Jeremy to wash his hands with soap and water.
   b. Lance the puncture with a scalpel to induce bleeding.
   c. Help him complete an exposure report right away.
   d. Call the physician in the office to ask for advice.
   e. Drive him to an occupational health clinic.

14. One example of PPE includes:
   a. name tag.
   b. stethoscope.
   c. face shield.
   d. scrub pants.
   e. syringe.

15. A patient arrives at the urgent care center complaining of nausea. As you begin to assess her, she begins to vomit bright red blood. Which of the following sets of PPE would be most appropriate to wear in this circumstance?
   a. Gown, gloves, and booties
   b. Eyewear, gown, and uniform
   c. Face shield and safety glasses
   d. Gloves, face shield, and gown
   e. Face shield, gown, and booties

16. Which of the following statements is true regarding hepatitis B virus (HBV)?
   a. HBV dies quickly outside the host body.
   b. There are no effective treatments for HBV.
   c. There is no vaccine protection against HBV.
   d. HBV is transmitted through blood contact, such as a needle puncture.
   e. It is easier to contract human immunodeficiency virus (HIV) than HBV.

17. Which of the following is not part of the body’s natural defenses against disease?
   a. Plasma in blood
   b. Mucus in the nose
   c. Lysozyme in tears
   d. Saliva in the mouth
   e. Acid in the stomach
18. A vial of blood fell on the floor, glass broke, and the contents spilled on the floor. Proper cleaning of this spill includes:
   a. depositing the blood-soaked towels into a biohazard container.
   b. pouring hot water carefully onto the spill to avoid any splash.
   c. notifying the physician.
   d. allowing the blood to dry before cleaning.
   e. trying to piece the vial back together.

19. If a biohazard container becomes contaminated on the outside, you should:
   a. fill out a biohazard report form.
   b. immediately wash the surface in a sink.

20. You should change your gloves after:
   a. touching a patient's saliva.
   b. measuring a patient's weight.
   c. auscultating a blood pressure.
   d. palpating a patient's abdomen.
   e. taking a patient's temperature.

MATCHING

Match each key term with its description.

<table>
<thead>
<tr>
<th>Key Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. _____ aerobe</td>
<td>a. the killing or rendering inert of most, but not all, pathogenic microorganisms</td>
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<tr>
<td>22. _____ asymptomatic</td>
<td>b. disease-causing microorganisms</td>
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<td>23. _____ disinfection</td>
<td>c. bacterial life form that resists destruction by heat, drying, or chemicals</td>
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<tr>
<td>24. _____ germicide</td>
<td>d. highly pathogenic and disease-producing; describes a microorganism</td>
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<td>25. _____ immunization</td>
<td>e. chemical that kills most pathogenic microorganisms; disinfectant</td>
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<td>26. _____ microorganisms</td>
<td>f. maintenance of a healthful, disease-free environment</td>
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<tr>
<td>27. _____ pathogens</td>
<td>g. microscopic living organisms</td>
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<td>28. _____ resistance</td>
<td>h. usual steps to prevent injury or disease</td>
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<td>29. _____ spore</td>
<td>i. without any symptoms</td>
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<td>30. _____ sanitation</td>
<td>j. body's immune response to prevent infections by invading pathogenic microorganisms</td>
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<td>31. _____ standard precautions</td>
<td>k. microorganism that requires oxygen to live and reproduce</td>
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<td>32. _____ virulent</td>
<td>l. act or process of rendering an individual immune to specific disease</td>
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</table>
33. Indicate whether the following microorganisms are resident or transient flora by writing RF (resident flora) or TF (transient flora) on the line preceding the name of the microbe and its location on or in the body.

   a. ___________ Escherichia coli (large intestine)
   b. ___________ Staphylococcus aureus (subcutaneous tissue)
   c. ___________ Escherichia coli (peritoneum)
   d. ___________ Staphylococcus aureus (epidermis; skin)
   e. ___________ Helicobacter pylori (digestive tract)

34. Indicate whether the following situations could be a direct or indirect mode of disease transmission by writing D (direct) or I (indirect) on the line preceding the situation.

   a. ___________ Shaking hands with someone
   b. ___________ Getting a mosquito bite
   c. ___________ Cleaning up a broken blood tube on the floor without gloves
   d. ___________ Sneezing
   e. ___________ Removing a tick from your leg
   f. ___________ Sharing a soda with a friend using the same straw

35. What should a medical assistant wear when facing specific types of bodily fluids? Place a check mark on the line under each of the types of PPE you would use based on the patient's presentation.

<table>
<thead>
<tr>
<th>Patient Presentation</th>
<th>Gloves</th>
<th>Protective Eyewear</th>
<th>Mask</th>
<th>Gown</th>
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</thead>
<tbody>
<tr>
<td>a. Abdominal pain, vomiting</td>
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<tr>
<td>b. Abdominal pain</td>
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<tr>
<td>c. Headache, coughing</td>
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<tr>
<td>d. Confusion</td>
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<tr>
<td>e. Fever, nonproductive cough</td>
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<tr>
<td>f. Generalized weakness</td>
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</table>
36. Your body is in a constant state of war—battling pathogens that are intent on getting into your body to grow and reproduce. Fortunately, your body has a variety of mechanisms to fight off pathogens. For each of the body structures below, explain how it fights the pathogens to protect the body.

a. Nose cilia: _________________________________________________________________

b. Mucus: _______________________________________________________________________

c. Skin: ________________________________________________________________________

d. Urination: _____________________________________________________________________

e. Tears: _______________________________________________________________________

f. Saliva: _______________________________________________________________________

g. Stomach: _____________________________________________________________________

37. A nondisposable vaginal speculum has just been used by the physician on a patient. After the exam is over and the patient leaves, how do you prepare this equipment for the next patient?

_______________________________________________________________________________

_______________________________________________________________________________

_______________________________________________________________________________

_______________________________________________________________________________

38. Name four factors that affect the disinfection process.

_______________________________________________________________________________

_______________________________________________________________________________

_______________________________________________________________________________

_______________________________________________________________________________

39. You accidentally stick yourself with a bloody needle. After washing the site, describe what you should do next.

_______________________________________________________________________________

_______________________________________________________________________________

_______________________________________________________________________________

_______________________________________________________________________________
TRUE OR FALSE?

Indicate whether the statements are true or false by placing the letter T (true) or F (false) on the line preceding the statement.

a. _____ Adhering to “clean technique,” or medical asepsis, ensures that an object or area is free from all microorganisms.

b. _____ Sterilization is the highest level of infection control.

c. _____ Low-level disinfection destroys bacteria, but not viruses.

d. _____ There are three levels of disinfection: minor, moderate, and severe.

e. _____ Handwashing is a form of surgical or sterile asepsis.

CASE STUDIES FOR CRITICAL THINKING

1. Mei Lin is a clinical medical assistant who works in an outpatient clinic. Today she arrives at work with a minor cold. Over the course of an hour, she sees four patients. She draws a blood sample from one patient and retrieves a urine sample from another patient. During the hour she sneezes three times. She is preparing to leave for her lunch break. How many times should she have washed her hands during this time period?

2. Your patient is a 24-year-old female who has been diagnosed with bacterial pneumonia. The physician has ordered antibiotic therapy and bedrest. When leaving the office, she tells you that she is concerned about the fact that she has a 7-month-old baby at home. What information could you give her to clearly explain what steps she can take to avoid transmitting her illness to her child?
3. An established patient in your office is a 38-year-old female with AIDS. One of your coworkers, Steve, is afraid of interacting with this patient and has made disparaging remarks about her in the back office. You worry that Steve’s attitude will affect patient care and you decide to talk to him privately. What points will you make? Should you also talk with your supervisor about Steve? Why, or why not?

4. The test results for 15-year-old Ashley Lewis come in and show that she is positive for hepatitis C. Her mother phones and asks you for the results. Is it appropriate for you to give her mother the test results? Why, or why not? How would you handle this call?

5. A middle-aged male comes into the medical office with a low-grade fever and productive cough that has lasted several weeks. The physician orders a chest x-ray to aid in diagnosis. After the patient leaves to get his chest x-ray, you begin to clean the room for the next patient. What level of disinfection will you use? What product(s) will you use? Provide detailed information about your actions, including dilution instructions, if appropriate.

6. You work in a pediatrician’s office and have been working extra hours to save for a new, more reliable vehicle. Between work and school, you are tired and rundown. This morning, you woke up with a sore throat and headache. The last thing you want to do is call in sick because you need the money and you want your supervisor to think you are reliable. What should you do? Explain your answer.
**PROCEDURE 17-1 Perform Medical Aseptic Handwashing**

Name: __________________________  Date: ________  Time: ________  Grade: ________

**EQUIPMENT/SUPPLIES:** Liquid soap, disposable paper towels, an orangewood manicure stick, a waste can

**STANDARDS:** Given the needed equipment and a place to work the student will perform this skill with _______% accuracy in a total of _______ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin.)*

**KEY:**  
4 = Satisfactory  
0 = Unsatisfactory  
NA = this step is not counted

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
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<tbody>
<tr>
<td>1. Remove all rings and wristwatch.</td>
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<tr>
<td>2. Stand close to the sink without touching it.</td>
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<tr>
<td>3. Turn on the faucet and adjust the temperature of the water to warm.</td>
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<tr>
<td>4. Wet hands and wrists, apply soap, and work into a lather.</td>
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<tr>
<td>5. Rub palms together and rub soap between your fingers at least 10 times.</td>
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<tr>
<td>6. Scrub one palm with fingertips, work soap under nails, and then reverse hands.</td>
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<tr>
<td>7. Rinse hands and wrists under warm running water.</td>
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<tr>
<td>8. Hold hands lower than elbows and avoid touching the inside of the sink.</td>
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<tr>
<td>9. Using the orangewood stick, clean under each nail on both hands.</td>
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<tr>
<td>10. Reapply liquid soap and rewash hands and wrists.</td>
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<tr>
<td>11. Rinse hands again while holding hands lower than the wrists and elbows.</td>
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<tr>
<td>12. Use a dry paper towel to dry your hands and wrists gently.</td>
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<tr>
<td>13. Use a dry paper towel to turn off the faucets and discard the paper towel.</td>
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</tbody>
</table>

**CALCULATION**

Total Possible Points: ________

Total Points Earned: ________  Multiplied by 100 = ________  Divided by Total Possible Points = ________ %

**PASS** ☐  **FAIL** ☐  **COMMENTS:**

Student’s signature ___________________________________________ Date ________

Partner’s signature ___________________________________________ Date ________

Instructor’s signature _________________________________________ Date ________
## PSY Procedure 17-2 Remove Contaminated Gloves

**Name:** ___________________________ **Date:** ________ **Time:** ________ **Grade:** ________

**Equipment/Supplies:** Clean examination gloves; biohazard waste container

**STANDARDS:** Given the needed equipment and a place to work the student will perform this skill with _______% accuracy in a total of ________ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin.)*

**KEY:**

- 4 = Satisfactory
- 0 = Unsatisfactory
- NA = this step is not counted

### Calculation

- Total Possible Points: ________
- Total Points Earned: ________ Multiplied by 100 = ________ Divided by Total Possible Points = ________ %

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Choose the appropriate size gloves and apply one glove to each hand.</td>
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<tr>
<td>2. After “contaminating” gloves, grasp the glove palm of the nondominant hand with fingers of the dominant hand.</td>
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<tr>
<td>3. Pull the glove away from the nondominant hand.</td>
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<td>4. Slide the nondominant hand out of the contaminated glove while rolling the contaminated glove into the palm of the gloved dominant hand.</td>
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<tr>
<td>5. Hold the soiled glove in the palm of your gloved hand.</td>
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</tr>
<tr>
<td>a. Slip ungloved fingers under the cuff of the gloved hand.</td>
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<tr>
<td>b. Stretch the glove of the dominant hand up and away from your hand while turning it inside out with the nondominant hand glove balled up inside.</td>
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<tr>
<td>6. Discard both gloves as one unit into a biohazard waste receptacle.</td>
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<tr>
<td>7. Wash your hands.</td>
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</tbody>
</table>

**Comments:** ___________________________

**Student’s signature** ____________________________ **Date:** ________

**Partner’s signature** ____________________________ **Date:** ________

**Instructor’s signature** ____________________________ **Date:** ________
PROCEDURE 17-3  Cleaning Biohazardous Spills

Name: __________________________  Date: _________  Time: _________  Grade: _________

EQUIPMENT/SUPPLIES: Commercially prepared germicide or 1:10 bleach solution, gloves, bag, protective eyewear (goggles or mask and face shield), disposable shoe coverings, disposable gown or apron made of plastic or other material that is impervious to soaking up contaminated fluids.

STANDARDS: Given the needed equipment and a place to work the student will perform this skill with ________% accuracy in a total of ________ minutes. (Your instructor will tell you what the percentage and time limits will be before you begin.)

KEY: 4 = Satisfactory  0 = Unsatisfactory  NA = this step is not counted

PROCEDURE STEPS  SELF  PARTNER  INSTRUCTOR

1. Put on gloves.  □  □  □

2. Wear protective eyewear, gown or apron, and shoe covers if splashing is anticipated.  □  □  □

3. Apply chemical absorbent to the spill.  □  □  □

4. Clean up the spill using disposable paper towels.  □  □  □

5. Dispose of paper towels and absorbent material in a biohazard waste bag.  □  □  □

6. Further decontaminate using a commercial germicide or bleach solution:
   a. Wipe with disposable paper towels.  □  □  □
   b. Discard the towels used for decontamination in a biohazard bag.  □  □  □

7. With gloves on, remove the protective eyewear and discard or disinfect.  □  □  □

8. Remove the gown/apron and shoe coverings and place in biohazard bag.  □  □  □

9. Place the biohazard bag in an appropriate waste receptacle.  □  □  □

10. Remove contaminated gloves and wash hands thoroughly.  □  □  □

CALCULATION

Total Possible Points: ________
Total Points Earned: ________ Multiplied by 100 = ________ Divided by Total Possible Points = ________ %

PASS  FAIL  COMMENTS:
□  □  

Student’s signature ___________________________ Date _________
Partner’s signature ___________________________ Date _________
Instructor’s signature ___________________________ Date _________